

Remarks/Arguments

On entry of this amendment into the record, there will be claims 1-26 and 29-55 in the above-identified patent application.

In reference to the Final Rejection, it is believed that the objections to claims 1 and 44 have been overcome by amending the claims as suggested by the Examiner.

With respect to the objection to claims 1, 16, 29 and 42 as being indefinite, it is believed that the claims are definite and unambiguous in the respect that the universal host can be used for red, green and blue dopants. Whether the universal host is actually used for the three dopants depends on application since in some instances, the required emission need not include all three colors. However, the Examiner's suggestion is invited as to how best to overcome this objection.

With respect to claims 50 and 51, it is believed that the objection has been overcome by making claim dependent on claim 44 and deleting the term "transparent" from claims 50 and 51.

In reference to claims 52 and 53, it is believed that the objection has been overcome by making claim 52 dependent on claims 44.

In reference to claims 54 and 55, it is believed that the objection has been overcome by making claim 54 dependent on claim 44.

Claims 1-3,5,7 and 10-13 stand finally rejected under 35 USC 102(e) as being anticipated by the Takahashi reference. The Examiner contends that the Takahashi discloses an organic light emitting diode comprising a single universal host (14 in Fig. 5) that can be used for red, green and blue dopants for full color display, disclosed in col. 2 in lines 51-52. Contrary to the Examiner's position, the Takahashi reference does not disclose the claimed universal host nor a full color display device. As noted starting in col. 2 in line 37 of the Takahashi reference:

“...A method has been suggested to obtain luminescence from a pigment by dispersing the pigment in polyvinylcarbazole (PVK)...As for the pigments for obtaining luminescence of colors, TPB, Coumarin 6, and Nile Red are used for obtaining blue color, green color, and red color, respectively. It is also possible to use these pigments simultaneously so as to obtain a white luminescence.”

Therefore, it is requested that the final rejection of claims 1-3, 5, 7 and 10-13 on 35 USC 102(e) be retracted and the claims allowed.

Claims 16-18, 20, 22, 25-31, 33, 35, 38-43, 45, 47 and 50-53 stand finally rejected under 35 USC 102(b) as being anticipated by the Borner reference. The Examiner contends that the Borner reference discloses an organic light emitting diode comprising universal host that can be used for red, green and blue dopants for full color display, see col. 4 in line 32. Contrary to the Examiner's position, the Borner reference does not disclose such a universal host. What is disclosed at about the middle of col. 4 of the Borner reference is not a universal host that can be used for red, green and blue dopants. The Borner reference in col. 4 lines 29-33 discloses that either p-type layer, or the n-type layer, or both, may comprise the electroluminescent material 32 with one or several complexes of a rare earth metal ion with organic ligands is not tantamount to the herein-claimed universal host.

It is requested that the final rejection of claims 16-18, 20, 22, 25-31, 33, 35, 38-43, 45, 47 and 50-53 be retracted and the claims allowed.

Claims 4 and 9 stand finally rejected under 35 USC 103(a) as being obvious over the Takahashi reference in view of the Picciolo reference. The Examiner contends that the Takahashi reference discloses all of the claimed limitations except the BMB-2T universal host material, the

DPP red emitting material, and the BMB-2T electron transport layer. Since the Picciolo reference discloses the particular materials, the Examiner concluded that it would have been obvious to substitute the particular materials disclosed in the Picciolo reference into the Takahashi reference for the corresponding elements.

In connection with the herein-claimed device, what is done here is to take advantage of transfer mechanisms and the new direct electron hole recombination concept on the growth molecule. The new concept is important since it allows reliance not only on spectrum overlap between absorption of the guest molecule and the emission of the host. This opens up the field to many other guest and host molecules that otherwise would not be available had reliance only been made on energy transfer.

In addition to being antedated, see attached 131 Declaration, the Picciolo reference discloses a red emitting monochromatic device which has nothing to do with the herein claimed 3-color OLED. As already noted, the Takahashi reference does not disclose a universal host. Although the prior art discloses the various claimed materials in these and other claims, there is no suggestion to combine the references in the manner proposed by the Examiner since the proposed combination will not result in the herein-claimed device. What is made possible here is the use of a carrier transporting universal host and engineering it in such a way that the dopant that is used has its optical band gap within the depth of the host so that a newly discovered mechanism can be activated, the new mechanism being the electron host recombination on the guest molecule which makes the device more efficient than prior art devices which primarily rely on energy transfer. A universal host, as claimed herein, makes possible activation of the new mechanism. Please note that in col. 15, the Takahashi reference refers to item 5 of Fig. 3 as a

“luminous layer 5,” as it does to item 14 of Fig. 5 in col. 18 and to item 103 in Fig. 6 in col. 1, not a “universal host that can be used for red, green and blue dopants.”

Claim 6 stand finally rejected under 35 USC103(a) as being obvious over the Takahashi reference in view of the Picciolo reference and the Xie reference. In addition to the Picciolo reference, the Examiner is also relying on the Xie reference for its disclosure of the green emitting material DEQ. It is believed that claim 6 is unobvious over the applied references for the same reasons as claims 4 and 9, which claims were finally rejected on the Takahashi and the Piccioio references.

Claim 8 stands finally rejected under 35 USC 103(a) as being obvious over the Takahashi reference in view of the Lin reference. The Examiner has concluded that since the Takahashi reference discloses all of the claimed limitations except the hole transporting layer (HTL) NTB which is disclosed by the Lin reference, that it would be obvious to substitute one HTL for another.

This rejection is believed to be improper. The combined references would not result in the device claimed in claim 8 since the Takahashi reference does not disclose the universal host, as already discussed. Furthermore, the Lin reference has been, it is believed, antedated so that it is not a prior art reference and the rejection is unsustainable.

Claims 14 and 15 stand finally rejected under 35 USC 103(a) as being obvious over the Takahashi reference in view of the Baldo reference. The Examiner has concluded that since the Takahashi reference discloses all of the claimed limitations except the bathocuproine hole blocking layer which is disclosed by the Baldo reference, that it would be obvious to include the hole blocking layer.

This rejection is believed to be improper. The combined references would not result in the device claimed in claims 14 and 15 since the Takahashi reference does not disclose the universal host, as already discussed, and the resulting device would not be a full color display. In fact, neither of the applied references discloses a full color display device and the host of the Takahashi reference would not work in the device claimed herein.

Claims 19,24,32,37,44 and 49 stand finally rejected under 35 USC 103(a) as being obvious over the Borner reference in view of the Picciolo reference. The Examiner has concluded that since the Borner reference discloses all of the claimed limitations and the Picciolo reference discloses the red emitting material DPP and the electron transfer layer BMB-2T, that it would have been obvious to use the red emitting material DPP and the electron transport layer BMB-2T in the device of the Borner reference.

This rejection is believed to be improper. The combined references would not result in the device claimed in claims 19,24,32,37,44 and 49 since the Borner reference does not disclose the universal host which can emit red, green and blue colors. For instance, the pertinent portion of the disclosure in the Borner reference is believed to be the following, which appears in col. 4, lines 29-33:

“In this case, either the p-type layer, as in FIG. 2, or the n-type layer as in FIG. 1, or both, as in FIG. 3, may in addition comprise the electroluminescent material 32 with one or several complexes of a rare earth metal ion with organic ligands.”

What is claimed herein is a “universal host that can be used for red, green and blue dopants.” Furthermore, as already pointed out, the Picciolo reference discloses a red emitting monochromatic device which has nothing to do with the herein claimed 3-color OLED. Although

the prior art discloses the various materials in these and other claims, there is no suggestion to combine the references proposed by the Examiner since the proposed reference combination will not result in the herein-claimed device. As already noted, what is made possible here is the use of a carrier transporting universal host and engineering it in such a way that the dopant that is used has its optical band gap within the depth of the host so that a newly discovered mechanism can be activated, the new mechanism being the electron host recombination on the guest molecule which makes the device more efficient than prior art devices which primarily rely on energy transfer. A universal host, as claimed herein, makes possible activation of the new mechanism. Furthermore, the Picciolo reference has been, it is believed, antedated so that it is not a prior art reference and the rejection is unsustainable.

It is requested that claims 1-26 and 29-55 be allowed and the application be passed to issue.

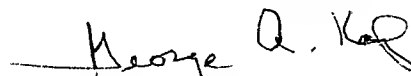
It is also requested that this amendment be entered into the record since it places the case in condition for allowance or in a better form for appeal.

It is hereby petitioned to extend the period for response one month to March 19, 2004. Please charge our account #50-0281 with \$110.00, or whatever is appropriate, for the extension of time.

A Notice of Appeal is enclosed appealing claims 1-26 and 29-55. Also enclosed are declarations antedating the Picciolo and the Lin references. Because two of the declarants are no

longer at the Naval Research Laboratory, their declarations are presented separately to show original faxed signatures.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "George A. Kap". The signature is written in a cursive style with a horizontal line extending from the left.

George A. Kap,
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